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Developing methods for In-situ TEM and potential studies in energy storage, electrochemistry, material science, and bioscience etc.

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Transmission electron microscope (TEM) is capable of imaging with a significantly high resolution, i.e., scale less than sub nanometer [1]. Conventional TEM can provide information including, morphology, composition, topographical and crystalline etc. . Thanks to the construction of micro/nanolab in TEM holder, recent years witness the rapid development of dynamic process studies with high spatial and temporal resolution. Remarkable research results have been demonstrated, for instance, nucleation process[2], crystal growth[3], intrinsic electrochemistry reactions for micro/nano battery[4].

Currently, we focus on designing and fabricating TEM holders with different capabilities for various applications. For instance, a TEM holder (Fig. 1a) with liquid flow and 5 electrical contacts is developed. It has a closed cell configuration (Fig. 1b) which could be used for battery, electrochemistry and bioscience researches. An open cell structured TEM holder with 16 electrical contacts is in the final stage of production. A TEM holder with heating/magnetic/optical elements is also under consideration. More information about different TEM holders and corresponding chips will be demonstrated in the conference. You are sincerely invited to make collaborations with us.

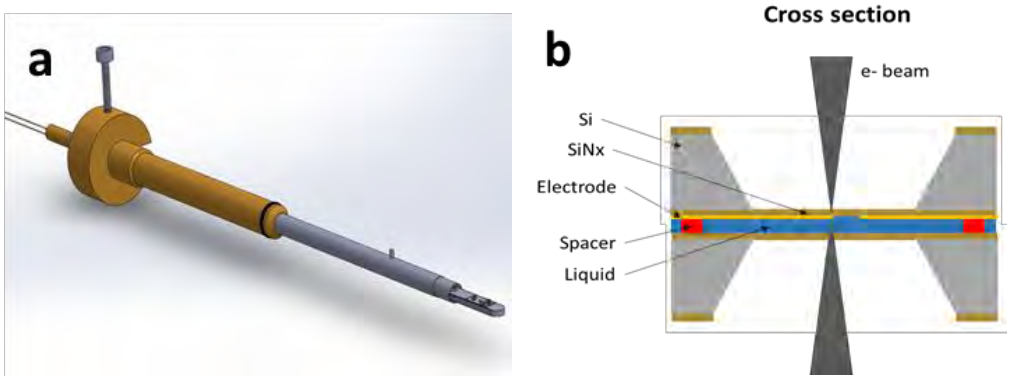

Figure 1. a). Schematic view of the manufactured TEM holder with liquid flow and 5 electrical contacts; b). Schematic cross section view of a double-chip setup with electron transparent window (SiNx) which is used for observing.

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